Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method of forming a waveguide comprising a core region, a cladding region, and an index contrast region situated therebetween, the method comprising:

depositing a polymerizable composite on a substrate to form a layer, wherein the polymerizable composite comprises a polymer binder and an uncured monomer,

patterning the layer to define an exposed area and an unexposed area of the layer in a manner such that the unexposed area includes the core region,

irradiating the exposed area of the layer to polymerize the polymerizable composite in the exposed area, and

volatilizing the uncured monomer in the unexposed area by diffusing some uncured monomer from the unexposed area towards the exposed area to ~~form the waveguide, wherein the polymerizable composite comprises a polymer binder and sufficient quantities of an uncured monomer to diffuse into the exposed area of the layer and~~ form the index contrast region of the waveguide.

2. (original) The method of claim 1, wherein the polymer binder comprises at least one of an acrylate polymer, a polyester, a polyimide, a polycarbonate, a polysulfone, a polyether ketone, and combinations thereof.

3. (original) The method of claim 1, wherein the polymer binder comprises an acrylate polymer comprising at least one of a poly(methyl methacrylate), poly(tetrafluoropropyl methacrylate), poly(2,2,2-triflouroethyl methacrylate), copolymers comprising structural units derived from an acrylate polymer, and combinations thereof.

4. (original) The method of claim 1, wherein the uncured monomer comprises at least one of an acrylic monomer, a cyanate monomer, a vinyl monomer, an epoxide-containing monomer, and combinations thereof.

5. (original) The method of claim 1, wherein the uncured monomer comprises at least one of benzyl methacrylate, 2,2,2-trifluoroethyl methacrylate, tetrafluoropropyl methacrylate, methyl methacrylate, 3-4-epoxycyclohexylmethyl-3,4-epoxycyclohexane carboxylate, bisphenol A diglycidyl ether, bisphenol F diglycidyl ether, styrene, allyl diglycol carbonate, and cyanate ester.

6. (original) The method of claim 1, wherein irradiating the exposed area of the layer comprises irradiating the exposed area with ultraviolet radiation.

7. (original) The method of claim 1, wherein patterning the layer comprises patterning the layer using a gray scale mask.

8. (original) The method of claim 1 wherein patterning comprises patterning the layer to define at least one curve.

9. (canceled)

10. (original) The method of claim 9 wherein the polymerizable composite comprises a polysulfone/epoxy blend.

11. (previously presented) The method of claim 9 wherein patterning is performed in a manner such that the unexposed area further includes a diffusion source region.

12. (canceled)

13. (original) The method of claim 11 wherein the polymerizable composite comprises an acrylic/epoxy blend.

14. (original) The method of claim 13 wherein polymerizable composite includes a concentration of at least about 25% uncured monomer.

15. (original) The method of claim 13 wherein polymerizable composite includes a concentration of at least about 40% uncured monomer.

16. (currently amended) A method of forming a waveguide comprising a core region, a cladding region, and an index contrast region situated therebetween, the method comprising:

providing a polymerizable composite comprising a polymer binder and an uncured monomer,

depositing the polymerizable composite on a substrate to form a layer,

patterning the layer to define an exposed area and an unexposed area of the layer, one portion of the unexposed area comprising the core region and another portion of the unexposed area comprising a diffusion source region,

irradiating the exposed area of the layer to polymerize the polymerizable composite in the exposed area, and

volatilizing the uncured monomer in the core and diffusion source regions to diffuse some uncured monomer from the unexposed area towards the exposed area and form the ~~waveguide and~~ index contrast region of the waveguide.

17. (original) The method of claim 16, wherein the polymer binder comprises at least one of an acrylate polymer, a polyester, a polyimide, a polycarbonate, a polysulfone, a polyether ketone, and combinations thereof.

18. (original) The method of claim 16, wherein the polymer binder comprises an acrylate polymer comprising at least one of a poly(methyl methacrylate), poly(tetrafluoropropyl methacrylate), poly(2,2,2-triflouroethyl methacrylate), copolymers comprising structural units derived from an acrylate polymer, and combinations thereof.

19. (original) The method of claim 16, wherein the uncured monomer comprises at least one of an acrylic monomer, a cyanate monomer, a vinyl monomer, an epoxide-containing monomer, and combinations thereof.

20. (original) The method of claim 16, wherein the uncured monomer comprises at least one of benzyl methacrylate, 2,2,2-trifluoroethyl methacrylate, tetrafluoropropyl methacrylate, methyl methacrylate, 3-4-epoxycyclohexylmethyl-3,4-epoxycyclohexane carboxylate, bisphenol A diglycidyl ether, bisphenol F diglycidyl ether, styrene, allyl diglycol carbonate, and cyanate ester.

21. (original) The method of claim 16, wherein irradiating the exposed area of the layer comprises irradiating the exposed area with ultraviolet radiation.

22. (original) The method of claim 16, wherein patterning the layer comprises patterning the layer using a gray scale mask.

23. (original) The method of claim 16, wherein patterning comprises defining the diffusion source region adjacent to the index contrast region.

24. (original) The method of claim 23 wherein at least one end portion of the diffusion source region is situated further from the core region than a center portion of the diffusion source region.

25. (original) The method of claim 24 wherein the diffusion source region is patterned to form an adiabatic mode-converter.

26. (original) The method of claim 16, wherein the diffusion source region comprises at least two diffusion source regions.

27. (original) The method of claim 26, wherein the at least two diffusion source regions include diffusion source regions situated on opposing sides of the core region.

28. (original) The method of claim 27, wherein the at least two diffusion source regions further include multiple diffusion source regions situated on one side of the core region.

29. (original) The method of claim 26, wherein the at least two diffusion source regions include multiple diffusion source regions situated on one side of the core region.

30. (original) The method of claim 29, wherein the multiple diffusion source regions are each adjacent to the index contrast region.

31. (original) The method of claim 29, wherein at least one of the multiple diffusion source regions is situated between the core region and at least one other of the multiple diffusion source regions.

32. (original) The method of claim 26, wherein the at least two diffusion source regions comprise at least one device selected from the group consisting of Omni reflectors, Bragg gratings, directional couplers, and combinations thereof.

33-63. (canceled)